DOCUMENT RESUME

ED 208 726 HE 014 380

AUTHOR Hortin, John A.
TITLE Successful Examples of Instructional Technology in Higher Education.
PUB DATE [81]
NOTE 12p.

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Audiotape Recordings; *Audiovisual Aids; *College Programs; *Computer Assisted Instruction; Educational Development; Educational Media; *Educational Technology; *Educational Television; Higher Education; Independent Study; Videotape Cassettes
IDENTIFIERS PLATO

ABSTRACT

College programs considered to be successful in their use of instructional technology are described. The definition of instructional technology used to judge the media programs is as follows: a systematic approach to improve learning through media management, educational program development, and learning resources. Programs include the following: the audiotutorial system developed by Postlethwait at Purdue University for teaching botany to freshmen; the PLATO (Programmed Logic for Automatic Teaching Operations) project at the University of Illinois; Philadelphia's Hahnemann Medical College and Hospital's use of surgical applications of television magnification; the Georgia Center for Continuing Education's eight-part television series "New Wrinkles on Retirement," field seminars for people contemplating retirement; the independent study program at the University of Minnesota; the Rochester Institute of Technology's individualized instructional program through television; the Community Learning Centre project's mailed videocassettes for communities in remote areas; audiocassette tapes at the Extension Services in Pharmacy at the University of Wisconsin, Madison; and Utah State University's use of the instructional design process to create six courses. The Postlethwait audiotutorial program contains a self-study packet composed of audiotapes, a laboratory workbook, specimens, experimental equipment, slides, and films. Some of the areas of study that have been associated with the PLATO system are library science, geometry, electrical engineering, nursing, chemistry, algebra, computer programming, and foreign languages. (SW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED208726

Successful Examples of Instructional Technology in Higher Education

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

John A. Hortin

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)"

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

✓ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

John A. Hortin

Kansas State University

HE 014-320

Abstract

Research in instructional technology has generally shown that there is no significant difference in terms of successful learning between classes that use media and those that use more traditional methods. However, there are some examples of successful media programs in higher education that professors and other educators should be made aware of. This paper examines those programs that are considered to be successful in their use of instructional technology.

Successful Examples of Instructional Technology in Higher Education

by

John A. Hortin
Kansas State University

Research in instructional technology has shown no significant difference in learning between students in classes that use media and those in classes that use traditional teaching methods (4:147-149, 7:10, 9:147, 23:194, 24:10, 25:82). This paper will present examples of instructional technology or media programs that have been successful according to both the definition of instructional technology and the six benefits of instructional technology Tickton (26:32-35) lists. As set forth by Tickton, these six benefits are:

1. Technology can make education more productive.
2. Technology can make education more individual.
3. Technology can give instruction a more scientific basis.
4. Technology can make instruction more powerful.
5. Technology can make learning more immediate.
6. Technology can make access to education more equal.

In addition to the advantages Tickton sees, there are others; for example, technology can make the student more involved in a subject, technology can store information until the student is ready to use it (26:31), and technology can relay information over long distances (1:78-79, 5:62-72, 23: 163-165). Media can also give the student the opportunity to interact and respond in many ways (22:40, 202-205; 26:31).

The definition of instructional technology used to judge the media programs considered here was synthesized from two definitions, one developed by the Association for Educational Communications and Technology (2) and the other by Tickton (256:7). Accordingly, instructional technology is a systematic approach to improve learning through media management, educational program development and learning

resources and is based upon research in human learning and communication. The important components of the definition are:

1. improvement of learning
2. systematic approach
3. media management
4. educational program development
5. learning resources.

One of the best examples of a media program that incorporates all the components of the definition and has many of the benefits lisced is the audio-tutorial system developed by Postlethwait (20:17-19, 21:9-20) at Purdue University for teaching botany to freshmen. The program started when Postlethwait recorded his comments about the past week's botany lectures and put them on reserve on the learning center for review by the students. From this nascent stage the audio-tutorial program evolved into a highly sophisticated program that is a self-study packet composed of audio tapes, a laboratory workbook, specimens, experimental equipment, two-by-two inch slides, and motion picture films. The system permits the botany student to work at his own pace, select specific areas on which he wants to concentrate, work with fellow students in the program, and have more time to work directly with his instructors (21:96).

The Postlethwait (21:16-18, 28:74) botany course is divided into three types of sessions. The general assembly session (GAS) meets once a week for a traditional lecture from the senior instructor. The small assembly session (SAS) is based on the theory that one really learns a subject when he is required to organize information on it and teach it. The SAS meets once a week with eight to ten students in each group. Each student is required to prepare a short presentation or experiment on material that he studied in the learning center during the previous week. The independent study session (ISS) in the learning center is the one in which the most media is used. At

the learning center the student selects the appropriate audio tapes, plant specimens, equipment, and media for individual study.

A second media program that has had considerable success is the PLATO (Programmed Logic for Automatic Teaching Operations) project at the Univeristy of Illinois (5:108-109, 22:202, 26:439-454, 28:81). Some of the areas of study that have been associated with this computer-based educational system are library science, geometry, electrical engineering, nursing, chemistry, algebra, computer programming, and foreign languages. A study of data gathered after 70,000 hours of student contact with the computer resulted in the development of a set of guidelines. These guidelines, reported in an article by Bitzer and Skaperdas (26:439), are significant in understanding the role media plays with education. Educators often distrust technology or feel threatened by it (1:10-13, 5:13). Bitzer and Skaperdas (26:439) suggest that the computer be used only when it is the best method of presentation and that other, less expensive methods be used when they are appropriate. The authors suggest that the computer-based program can be more cost effective if it is kept flexible and adaptive to teaching a plethora of subjects and providing the student with opportunity for plenty of drill and repetition, freeing the instructor for personal research or attention to a student's specialized need.

Another guideline developed by Bitzer and Skaperdas is a concept central to instructional design (3:226, 509-510) and media selection for the affective domain (30:9): the computer should simulate models constructed by the student as close to the "real" world as possible. Learning by computer is believed to be most effective when the exercises or experiments used are like those that would be used if the computer were not part of the program.

Other authors have suggested that technology be used only as a supplement to teaching or only when technology will uniquely serve a specialized need (3:226-227, 15:46-47, 23:334-341, 25:83). Postlethwait feels that the single most important ingredient to any educational program is the teacher. The success or lack of success of any system is a direct measure of the professor's willingness to work within that system (20:19).

The Postlethwait and PLATO programs are among the best-known and most successful instructional technology systems in higher education, but there are others as well, including many that concentrate on a specific kind of media. In television, for instance, there are Hahnemann Medical College and Hospital in Philadelphia's use of surgical applications of television magnification (28:26-27) and the Georgia Center for Continuing Education's eight-part television series "New Wrinkles on Retirement," field seminars for people contemplating retirement (27:344-346).

Another example of the successful use of television in adult or continuing education is the independent study program at the University of Minnesota (13:303-304, 311). The program began as an experiment called Television College but failed because classes in the Television College were treated in the same way as on-campus classes. When the developers of the program created Television Independent Study, they made an effort to meet the special needs of students who lived off campus. That is, the developers presented courses that had broad degree applications, that reflected current interests of the communities served, and that provided opportunity for professional improvement such as teacher certification.

Two other programs for adult education are the Rochester Institute of Technology, one of individualized instruction through television

(14:20-25), and the Community Learning Centre project of Newfoundland and Labrador (6:22-25). In this project videocassettes presenting ideas and information were mailed to remote communities. Suggestions were sought from the public and information was made available on such diverse topics as volunteer fire departments, income tax, careers for young people, self-examination for breast cancer, and the use of net bags in fishing. Canadian government officials made videocassettes explaining new policies or laws and these media were also sent to the public. The people in these remote regions could respond by sending videocassettes back to the officials. Thus, as Tickton (26:31) says, "They [technologies] can give the student the opportunity to react to the material and respond in many ways."

At the University of Michigan, Viviano (29:8-9) went so far as to drop written texts altogether in teaching writing. Instead, he used commercial television as a starting point for discussion, feeling that students would be more comfortable in expressing themselves on programs such as "M.A.S.H." rather than Shakespeare.

Another type of media, that of audio cassette tapes, was used at the Extension Services in Pharmacy at the University of Wisconsin - Madison. A study had determined that non-practicing pharmacists felt isolated from their profession because they found it difficult to keep up with the rapid changes in the field (10:157-166). Many of the 10,000 or so non-practicing pharmacists in the Midwest, the study found, were women with household or family responsibilities that precluded their working in the field. With this kind of student in mind, the faculty of the Extension Services in Pharmacy designed a course using one-hour audio cassette tapes which could be mailed to the participants. Tests conducted in connection with the program

showed that after taking the course, a non-practicing pharmacist could demonstrate a competency equal to that of a practicing pharmacist.

Instructional technology involves the use of media but is more than just the use of media. In higher education, instructional or media technologists have worked in the area called instructional design. Utah State University (11:7) used the instructional design process to create six courses in which students have shown substantial improvement in attitude and achievement. Mager (17:12-20) cites a number of instances in which instructional design has saved industry and the military both money and time. Because of instructional technology, American Airlines has saved fuel in training its pilots. Using goal analysis (16) A.T.&T. was able to reduce the number of days of one of its training courses from forty-five days to nine at a savings of $37,800,000 (17:15-16).

Perhaps one of the most difficult problems instructional technologists face is putting into practice a successful program at a university. The Carnegie Commission (8) has made recommendations; Fraley and Vargas (12:1-15) have called for a reorganization of the traditional university structure; Norris (19:451-459) has proposed a learning center network. One of the more traditional plans that has worked well at a research institution is that of McIntyre (18). His Office of Instructional Resources plan for the University of Illinois - Chicago Circle is an outline of basic services needed at an urban university but is patterned after the program at the University of Illinois - Champaign.

These have been a few examples of instructional design and technology programs that have worked; many are still working. There is need for more research and experimentation but one can say that instructional technology is alive and well in higher education.

REFERENCES

1. Armsey, James W., and Norman C. Dahl. An Inquiry Into the Uses of Instructional Technology. New York: The Ford Foundation, 1973.

2. Association for Educational Communications and Technology. Educational Technology: Definition and Glossary Terms. Vol. I. Washington, D. C.: AECT, 1977.

3. Briggs, Leslie J., ed. Instructional Design Principles and Applications. Englewood Cliffs, New Jersey: Educational Technology Publications, 1977.

4. _____ and others. Instructional Media: A Procedure for the Design of Multi-Media Instruction, A Critical Review of Research, and Suggestions for Future Research. Pittsburgh: American Institutes for Research, 1967.

5. Brown, James W., and James W. Thornton, Jr., eds. New Media in Higher Education. Washington, D. C.: Association for Higher Education and Division of Audiovisual Instruction Service of the National Education Association, 1963.

6. Callanan, Charles. "The Community Learning Center Project of Newfoundland and Labrador," Audiovisual Instruction, XXII (February, 1977), 22-25.

7. Campeau, Peggie L. "Selective Review of the Results of Research on the Use of Audiovisual Media to Teach Adults," AV Communication Review, XXII, No. 1 (1974), 5-35.

8. Carnegie Commission on Higher Education. The Fourth Revolution, Instructional Technology in Higher Education. Hightstown, New Jersey: McGraw-Hill Book Company.

9. Deighton, Lee C., ed. The Encyclopedia of Education. 10 vols. New York: Macmillan Company and The Free Press, 1971.

10. DeMuth, James E., Kenneth W. Kirk, and Melvin H. Weinswig. "Continuing Education for Non-practicing Professionals: A Case Study of a Program for Pharmacists," Adult Education, XXVI, No. 3 (1976), 157-66.

11. Eastmond, J. Nicholls, and Kathleen L. Van Horn. So What's Different? Student Achievement Results from Instructional Development Projects. U.S. Educational Resources Information Center, ERIC Document ED 135 402, November, 1976.

12. Fraley, Lawrence E., and Ernest A. Vargas. "Academic Tradition and Instructional Technology," Journal of Higher Education, XLVI, No. 1 (1975), 1-15.

13. Goldstein, Sheldon, Audrey Willeke, and Roger G. Young. "Television Independent Study at the University of Minnesota," Adult Leadership, XXV (June, 1977), 303-4, 311.

14. Hooten, David E., and Richard D. Zakia. "Educational Technology and the Adult Learner," Educational Technology, XVI, (October, 1976), 20-25.

15. Kemp, Jerold E. Planning and Producing Audiovisual Materials. 3rd ed. New York: Thomas Y. Crowell, 1975.

16. Mager, Robert F. Goal Analysis. Belmont, California: Fearon Publishers, Inc., 1972.

17. _____. "The Winds of Change," Training and Development Journal, XXXI, No. 10 (1977), 12-20.

18. McIntyre, Charles J., and John B. Haney. Planning for Instructional Resources at a Rapidly Growing Urban University. Champaign, Illinois: University of Illinois, 1967.

19. Norris, William C. "Via Technology To A New Era In Education," Phi Delta Kappan, LVIII, No. 6 (1977), 451-459.

20. Postlethwait, S. N. "Audio Tape for Programming Instruction," Educational Broadcasting, (July/August, 1976), 17-19.

21. _____, J. Novak, and H. T. Murray, Jr. The Audio-Tutorial Approach to Learning. 2nd ed. Minneapolis: Burgess Publishing Company, 1969.

22. Pula, Fred John, and Robert J. Goff. Technology in Education: Challenge and Change. Worthington, Ohio: Charles A. Jones Publishing Company, 1972.

23. Romiszowski, A. J. The Selection and Use of Instructional Media. New York: John Wiley and Sons, 1974.

24. Schramm, Wilbur. Learning Depends More on How a Medium Is Used Than on Which Medium is Used. U.S. Educational Resources Information Center, ERIC Document Ed 152 242, May, 1974.

25. Sleeman, Phillip J., and D. M. Rockwell, eds. Instructional Media and Technology: A Professional's Resource. Stroudsburg, Pennsylvania: Dowden, Hutchinson and Ross, Inc., 1976.

26. Tickton, Sidney G., ed. To Improve Learning, An Evaluation of Instructional Technology. Vol. I. New York: R. R. Bowker Company, 1971.

27. Thornton, James W., and James W. Brown, eds. New Media and College Teaching. Washington, D. C.: The Department of Audio-visual Instruction, 1968.

28. Thorson, James B. "A Media Approach to Pre-Retirement Education," Adult Leadership, XXIV (June, 1976), 344-46.

29. Viviano, Frank. "Using Television to Teach Writing," Change, The Magazine of Learning, XI, No. 2 (1979), 8-9.

30. Wager, Walter. "Media Selection in the Affective Domain: A Further Interpretation of Dale's Cone of Cognitive and Affective Learning," Educational Technology, XV, No. 7 (1975), 9-13.